

IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

1-33 (Canceled)

34. (Currently amended) A method for noninvasively estimating at least one of a pulmonary capillary blood flow and a cardiac output of a patient, comprising:
evaluating respiration of the patient during a first ventilation state having a duration of about eighteen seconds to about sixty seconds; and
evaluating respiration of the patient during a second ventilation state having ~~substantially a same~~ duration ~~as said first ventilation state~~ of about eighteen seconds to about sixty seconds.

35. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~ the first ventilation state is conducted immediately before ~~said~~ evaluating respiration of the patient during ~~said~~ the second ventilation state.

36. (Currently amended) The method of claim 35, further comprising repeating ~~said~~ evaluating respiration of the patient during another first ventilation state immediately following ~~said~~ evaluating respiration of the patient during ~~said~~ the second ventilation state.

37. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~ the first ventilation state is effected for about 30 seconds.

38. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~ the second ventilation state is effected for about 30 seconds.

39. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state is effected for a duration of at least about 30% of a combined duration of evaluating respiration of the patient during both ~~said~~the first ventilation state and ~~said~~the second ventilation state.

40. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state is effected for a duration of at least about 30% of a combined duration of evaluating respiration of the patient during both ~~said~~the first ventilation state and ~~said~~the second ventilation state.

41. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state and ~~said~~the evaluating respiration of the patient during ~~said~~the second ventilation state are effected for a combined duration of at most about two minutes.

42. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state comprises ~~bi-directional~~evaluating respiration of the patient during rebreathing.

43. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state comprises employing a best-fit line method of rebreathing.

44. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state comprises evaluating respiration of the patient while the patient is breathing air.

45. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state comprises evaluating respiration of the patient

while the patient is breathing gas or a gas mixture comprising at least a concentration of oxygen present in air.

46. (Currently amended) The method of claim 34, further comprising optimizing a duration of at least one of ~~said~~the first ventilation state and ~~said~~the second ventilation state.

47. (Currently amended) The method of claim 34, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state is effected before ~~initiation of the~~
~~noninvasively estimating~~calculating the pulmonary capillary blood flow or cardiac output of the
patient.

48. (Currently amended) The method of claim 34, wherein a transition between ~~said~~the first and second ventilation states is gradual.

49. (Currently amended) The method of claim 34, further comprising optimizing durations of ~~said~~the first and second ventilation states.

50. (Currently amended) The method of claim 49, wherein ~~said~~ optimizing is based on ventilation of the patient.

51. (Currently amended) The method of claim 50, wherein ~~said~~ optimizing is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the patient.

52. (Currently amended) A method for noninvasively estimating at least one of a pulmonary capillary blood flow and a cardiac output of a patient, comprising:
evaluating respiration of the patient during a first ventilation state;
evaluating respiration of the patient during a second ventilation state immediately following
~~said~~the first ventilation state; and

evaluating respiration of the patient during another first ventilation state immediately following ~~said~~the second ventilation state, each of the first ventilation state, the second ventilation state, and the another first ventilation state having a duration of about eighteen seconds to about sixty seconds.

53. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state and ~~said~~the evaluating respiration of the patient during ~~said~~the second ventilation state are effected for substantially a same duration.

54. (Currently amended) The method of claim 53, wherein ~~said~~ evaluating respiration of the patient during the another first ventilation state is effected for substantially ~~said~~the same duration.

55. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state is effected for about 30 seconds.

56. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state is effected for about 30 seconds.

57. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during the another first ventilation state is effected for about 30 seconds.

58. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state is effected for at least about 30% of a combined duration of ~~said~~the evaluating respiration of the patient during ~~said~~the first ventilation state and evaluating respiration of the patient during ~~said~~the second ventilation state.

59. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state is effected for at least about 30% of a

combined duration of ~~said~~the evaluating respiration of the patient during ~~said~~the first ventilation state and ~~said~~the evaluating respiration of the patient during ~~said~~the second ventilation state.

60. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state and ~~said~~the evaluating respiration of the patient during ~~said~~the second ventilation state are effected for a combined duration of at most about 2 minutes.

61. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state comprises evaluating respiration of the patient during bi-directional-rebreathing.

62. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the first ventilation state comprises employing a best-fit line method of rebreathing.

63. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state comprises evaluating respiration of the patient while the patient is breathing air.

64. (Currently amended) The method of claim 52, wherein ~~said~~ evaluating respiration of the patient during ~~said~~the second ventilation state comprises evaluating respiration of the patient while the patient is breathing gas or a gas mixture comprising at least a concentration of oxygen present in air.

65. (Currently amended) The method of claim 52, further comprising optimizing a duration of at least one of ~~said~~the first ventilation state and ~~said~~the second ventilation state.

66. (Currently amended) The method of claim 52, wherein a transition between ~~said~~the second ventilation state and at least one of ~~said~~the first ventilation state and ~~said~~the another first ventilation state is gradual.

67. (Currently amended) The method of claim 52, further comprising optimizing durations of ~~said~~the first and second ventilation states.

68. (Currently amended) The method of claim 67, wherein ~~said~~ optimizing is based on ventilation of the patient.

69. (Currently amended) The method of claim 68, wherein ~~said~~ optimizing is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the patient.

70. (Currently amended) A differential Fick technique, consisting essentially of:
a first phase in which a change in the effective ventilation of a patient is induced; and
a second phase during which ~~said~~a change in the effective ventilation of the patient is ~~removed~~
not present, the first phase and the second phase having substantially the same duration.

71. (Currently amended) The differential Fick technique of claim 70, wherein durations of ~~said~~the first and second phases are substantially the same.

72. (Currently amended) The differential Fick technique of claim 70, wherein ~~said~~the first and second phases each have a duration of about 30 seconds.

73. (Currently amended) The differential Fick technique of claim 70, wherein a duration of ~~said~~the first phase is at least about 30% of a combined duration of ~~said~~the first and second phases.

74. (Currently amended) The differential Fick technique of claim 70, wherein a duration of ~~said~~the second phase is at least about 30% of a combined duration of ~~said~~the first and second phases.

75. (Currently amended) The differential Fick technique of claim 70, wherein ~~said~~the first and second phases are repeated in immediate sequence with one another.

76. (Currently amended) The differential Fick technique of claim 70, wherein a combined duration of ~~said~~the first and second phases is at most about two minutes.

77. (Previously presented) The differential Fick technique of claim 70, wherein ~~said~~the first phase comprises a rebreathing phase and ~~said~~the second phase comprises a nonbreathing phase.

78. (Currently amended) The differential Fick technique of claim 70, further comprising optimizing a duration of at least one of ~~said~~the first and second phases.

79. (Currently amended) The differential Fick technique of claim 70, wherein ~~said~~the second phase occurs before ~~said~~the first phase.

80. (Currently amended) The differential Fick technique of claim 70, wherein a transition between ~~said~~the first phase as ~~said~~the second phase is gradual.

81. (Currently amended) The differential Fick technique of claim 70, wherein durations of ~~said~~the first and second phases are optimized.

82. (Currently amended) The differential Fick technique of claim 81, wherein optimization of ~~said~~the durations of ~~said~~the first and second phases is based on ventilation of the patient.

83. (Currently amended) The differential Fick technique of claim 82, wherein ~~said~~the optimization is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the patient.

84. (Currently amended) A differential Fick technique, comprising:
inducing a change in effective ventilation of an individual for a first duration of time of about eighteen seconds to about sixty seconds;
removing ~~said~~the change in effective ventilation for a second duration of time of about eighteen seconds to about sixty seconds immediately following ~~said~~the first duration of time; and
obtaining measurements of at least one respiratory gas and of respiratory flow during both ~~said~~the first duration of time and ~~said~~the second duration of time.

85. (Currently amended) The differential Fick technique of claim 84, further comprising repeating ~~said~~ inducing immediately following ~~said~~the second duration of time.

86. (Currently amended) The differential Fick technique of claim 85, wherein ~~said~~ repeating is again effected for ~~said~~the first duration of time.

87. (Currently amended) The differential Fick technique of claim 85, including obtaining measurements of ~~said~~the at least one respiratory gas and ~~said~~the respiratory flow during ~~said~~ repeating.

88. (Previously presented) The differential Fick technique of claim 84, wherein ~~said~~the first duration of time of ~~said~~ inducing and ~~said~~the second duration of time of ~~said~~ removing are substantially the same.

89. (Previously presented) The differential Fick technique of claim 88, wherein ~~said~~the first duration of time of ~~said~~ inducing is at least about 30% of a combined duration of ~~said~~the first ~~said~~the duration of time and ~~said~~the second duration of time.

90. (Previously presented) The differential Fick technique of claim 88, wherein ~~said~~the second duration of time of ~~said~~ removing is at least about 30% of a combined duration of ~~said~~the first duration of time and ~~said~~the second duration of time.

91. (Currently amended) The differential Fick technique of claim 88, wherein ~~said~~ inducing and ~~said~~ removing are both effected for about 30 seconds.

92. (Currently amended) The differential Fick technique of claim 88, wherein a combined duration of ~~said~~ inducing and ~~said~~ removing is at most about two minutes.

93. (Previously presented) The differential Fick technique of claim 84, wherein ~~said~~ inducing comprises causing the individual to rebreathe.

94. (Previously presented) The differential Fick technique of claim 84, wherein ~~said~~ obtaining measurements comprises obtaining measurements of carbon dioxide in respiration of the individual.

95. (Currently amended) The differential Fick technique of claim 84, further comprising optimizing at least one of ~~said~~the first duration of time and ~~said~~the second duration of time.

96. (Currently amended) The differential Fick technique of claim 84, wherein a transition between ~~said~~ inducing ~~said~~the change and ~~said~~ removing ~~said~~the change is gradual.

97. (Currently amended) The differential Fick technique of claim 84, further comprising optimizing ~~said~~the first and second durations of time.

98. (Currently amended) The differential Fick technique of claim 97, wherein ~~said~~ optimizing is based on ventilation of the individual.

99. (Currently amended) The differential Fick technique of claim 98, wherein ~~said~~ optimizing is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the individual.

100. (Currently amended) A method for noninvasively determining at least one of a pulmonary capillary blood flow and a cardiac output of a patient, comprising:
inducing a change in effective ventilation of the patient for a first period of time;
removing ~~said~~the change in effective ventilation of the patient for a second period of time, which is substantially the same as the first period of time, immediately following ~~said~~ inducing;
and
repeating ~~said~~ inducing immediately following ~~said~~the second period of time.

101. (Currently amended) The method of claim 100, including obtaining measurements of at least one respiratory gas and respiratory flow during ~~said~~ inducing and ~~said~~ removing.

102. (Previously presented) The method of claim 101, wherein ~~said~~ obtaining measurements comprises obtaining a measurement of at least carbon dioxide in respiration of the patient.

103. (Currently amended) The method of claim 100, wherein ~~said~~the first period of time of ~~said~~ inducing and ~~said~~the second period of time of ~~said~~ removing are substantially the same.

104. (Currently amended) The method of claim 100, wherein ~~said~~ inducing comprises rebreathing.

105. (Currently amended) The method of claim 100, further comprising optimizing at least one of ~~said~~the first period of time and ~~said~~the second period of time.

106. (Currently amended) The method of claim 100, wherein a transition between ~~said~~ inducing ~~said~~the change and ~~said~~ removing ~~said~~the change is gradual.

107. (Currently amended) The method of claim 100, further comprising optimizing ~~said~~the first and second periods of time.

108. (Currently amended) The method of claim 107, wherein ~~said~~ optimizing is based on ventilation of the patient.

109. (Currently amended) The method of claim 108, wherein ~~said~~ optimizing is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the patient.

110. (Currently amended) A method for noninvasively determining at least one of a pulmonary capillary blood flow and a cardiac output of a patient, comprising:
evaluating respiration of the patient during a first phase in which a change in effective ventilation of the patient is induced for a first period of time; and
evaluating respiration of the patient following removal of ~~said~~the change in effective ventilation of the patient; ~~said~~the removal being effected for a second period of time immediately following ~~said~~the first period of time, the first and second periods of time each lasting for about eighteen seconds to about sixty seconds.

111. (Currently amended) The method of claim 110, further comprising repeating ~~said~~the first phase immediately following ~~said~~the second period of time and evaluating respiration of the patient during ~~said~~ repeating.

112. (Currently amended) The method of claim 110, wherein ~~each of said evaluations~~ evaluating respiration of the patient during the first phase and evaluating respiration of the patient following removal of the change in effective ventilation are effected for substantially the same duration of time.

113. (Currently amended) The method of claim 110, wherein each of ~~said evaluations~~ evaluating respiration during the first phase and evaluating respiration following removal of the change comprises measuring at least one respiratory gas and respiratory flow of the patient.

114. (Currently amended) The method of claim 113, wherein ~~said~~ measuring at least one respiratory gas comprises measuring at least respiratory carbon dioxide of the patient.

115. (Currently amended) The method of claim 110, wherein ~~said~~ evaluating respiration of the patient during ~~said~~ the first phase comprises evaluating respiration of the patient during rebreathing.

116. (Currently amended) The method of claim 110, further comprising optimizing at least one of ~~said~~ the first period of time and ~~said~~ the second period of time.

117. (Currently amended) The method of claim 110, wherein a transition between ~~said~~ the first phase and ~~said~~ the removal is gradual.

118. (Currently amended) The method of claim 110, further comprising optimizing ~~said~~ the first and second periods of time.

119. (Currently amended) The method of claim 118, wherein ~~said~~ optimizing is based on ventilation of the patient.

120. (Currently amended) The method of claim 119, wherein ~~said~~ optimizing is further based on at least one of a pulmonary capillary blood flow and a cardiac output of the patient.